BBE Algal Monitors

form integral part of massive monitoring exercise
driven by the

Water Framework Directive requirements

Million-euro boat expedition to test Danube pollution

The world's biggest river expedition of its kind, costing over one million Euros, has just been completed. Three ships travelled the length (2,375 km) of the Danube River and its main tributaries, from Regensburg (Germany) to Tulcea Romania, testing pollution and water quality. Known as the 'Joint Danube Survey 2 (JDS2)', the expedition has attracted the international cooperation of all Danube countries from Germany to Ukraine. Its main goal is to produce comparable and reliable information on water quality for the entire Danube and many of its main tributaries. Many parameters have been tested, from toxic pesticides and heavy metals to fish and plankton. Pollution is a major problem in the Danube River Basin. Nutrient, organic and hazardous pollution are all factors that could result in the Danube failing to meet the EU's law -- the Water Framework Directive.
The first JDS1 in 2001 had a mix of results. On the positive side, it found high levels of biodiversity and rare species. At the same time, results showed concern over organic and microbiological pollution, heavy metals, oil from ships, pesticides and chemicals.

The results from the JDS2, when they come out in summer 2008, will improve the ability of Danube country leaders to decide on what measures still need be taken to meet the EU law by 2015. They will also help Danube countries to implement the 'Danube River Protection Convention'.

BBE's contribution was to develop in conjunction with the University of Brno in the Czech Republic and the Water research Institute in the Netherlands an in situ algal monitor for rapid assessment of Benthic attached algae – ***The Benthofluor.***

The Diary entry in the JDS2 log book for 17/09/07, copied overleaf, gives a brief overview of the Benthofluor application.

The Benthofluor is an adaptation of the well-established Fluoroprobe from BBE, which is an insitu algal monitor capable of indicating total chlorophyll and the % of five different algal classes. It can be used to profile water bodies, used as a lab instrument with a cuvette adaptor, and now an indicator of the attached algae on rocks with the Benthofluor adaptor. A truly multipurpose tool.

For further details contact
Envitech Ltd

Tel: 02920 337134
Fax: 02920 337137
e-mail: sales@envitech.co.uk
www.envitech.co.uk

Diary entry

No more laboratory?

Date: 17.09.2007

Do river chemists have it easier than biologists? Stick in a wand, a rod or a piece of coloured paper directly into the river, and *voila* - instant results! In contrast, many biologists don't have the luxury of doing their tests *in situ*. Instead, they have to grab a sample in the field, contain it, bring it to a lab, place it under a microscope and figure out what is there, often with the help of thick scientific textbooks. That could change soon.

The EU Water Framework Directive (WFD) is giving such change a push, by requiring the good biological (ecological) status of rivers. And if biological testing was to become automated and *in situ*, that would make the work of biologists throughout Europe, and even across the globe, much easier. That is exactly what Slovakia's Jarmilla Makovinska, a JDS2 Core Team biologist, is trying out.

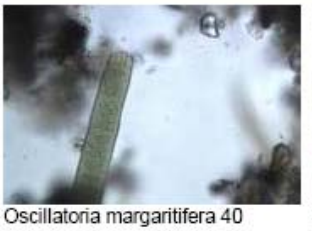
Her 'benthofluor' is a unique piece of equipment devised to measure `phytobenthos´, or specifically Chlorophyll-A - microscopic plants that are one of the most important of the five biological parameters to be tested under the WFD. The device is the creation of a group of international partners including Professor Blahos Marsalek from the University of Brno in the Czech Republic, his PhD student Corinna de Hoogh, Netherlands water research institute KIWA and German commercial company 'bbe Moldaenke'.

The JDS2 is the first time that the benthofluor was ever used along certain Danube stretches. Seen in action, Makovinska takes a stone from the water and tests its surface with a probe connected to the device which sends out fluorescent light. The reflection returning to the device is then translated into an amount of biomass (i.e. amount of phytobenthos), as well as instant electronic information about the classes of phytobenthos living on the stone. Makovinska later compares the results from the device with data she gets through classical data gathering - in other words, do the classes identified by the benthofluor match those she observes through her microscope in the Argus lab?

"It's a very quick method that can be used to get immediate results at many points along the same stretch of river, without any lab analysis needed," says Makovinska. "In some places, I couldn't find the right stones. But in most, about 80 percent of the time, I did."

In today's world of biology, there are two camps - one believing that just about any kind of biological testing will be doable *in situ*, and the other more conservative group that believes the lab way is the only way.

"I am very satisfied so far," she says. "It may not be very precise, but at least for applied biology where it is necessary to compromise, it gives good information." She adds that there is also a current trend to use such devices at fixed automatic sampling stations that continuously monitor samples. "But this is still under development."


Oscillatoria margaritifera 40


Giving Makovinska a lift to the shoreline


Makovinska wading for stones


Pleurococcus vulgaris 2


The benthofluor - a biologist's dream?


Benthofluor measuring chlorophll-A on Danube stone


Hildebrandia rivularis and red algae and stone


Cymatopleura solea 40

For further details contact
Envitech Ltd

Tel: 02920 337134
Fax: 02920 337137

e-mail: sales@envitech.co.uk

www.envitech.co.uk